

Applicant: Weadock et al.
Application No.: 09/391,762
Filing Date: September 8, 1999
Docket No.: 760-115 RES
Page 8

REMARKS

Reconsideration of the application as amended is respectfully requested.

Discussion of Amendments to the Claims

The claims have been amended to point out more particularly and to claim more distinctly the subject invention. In particular, claim 1 has been amended to recite that the pores are filled with a solid precipitate of a material of natural origin that is formed *in situ* from a solution that is pH-adjusted within the pores, and claims 7 and 9 have been amended in view of the amendment to claim 1. Claim 10 has been amended to change "pharmacologically active agent" to "pharmacological agent." Claim 13 has been amended to recite that the pores contain a solution of a biodegradable composition having an acidic pH, wherein the biodegradable composition forms a precipitate that substantially fills the pores at selected conditions of temperature and pH to form an insoluble an insoluble substrate site for cellular attachment. Claim 14 has been amended to recite that the biodegradable composition comprises at least one extracellular matrix protein or gelatin, and claim 15 has been amended to recite that the extracellular matrix protein or gelatin is selected from the group consisting of collagen I, collagen II, collagen III, collagen IV, collagen V, gelatin, vitronectin, fibronectin, laminin, reconstituted basement membrane matrices and derivatives and mixtures thereof. Claims 17 and 19 have been amended to replace the word "includes" with "further comprises." Moreover, claims 2-4, 7, 9-12, and 14-20 have been amended to correct obvious grammatical errors. Additionally, claim 5 has been cancelled, and claims 21-31 have been added. Support for the

Applicant: Weadock et al.
Application No.: 09/391,762
Filing Date: September 8, 1999
Docket No.: 760-115 RES
Page 9

amendments to the claims can be found in the instant specification at, for example, col. 2, lines 62-64, col. 3, lines 49-53, col. 4, lines 30-36, and col. 5, line 58, to col. 6, line 15. No new matter has been added by way of these amendments.

35 U.S.C. § 112, Second Paragraph (Indefiniteness) Rejection

Claims 5 and 7 stand rejected under 35 U.S.C. § 112, second paragraph, as allegedly indefinite. In particular, the Examiner contends that the phrase “substantially fills” in claim 5 and the phrase “collagen I-V and derivatives and mixtures thereof” in claim 7 renders those claims broader in scope than claim 1 (Office Action, page 2).

Claim 1 has been amended to recite a material of natural origin, and claim 5 has been cancelled. In view of the amendment to claim 1, and in view of the cancellation of claim 5, the basis for the rejection under 35 U.S.C. § 112, second paragraph, is moot. Accordingly, applicants respectfully request that the rejection under 35 U.S.C. § 112, second paragraph, be withdrawn.

35 U.S.C. § 102(b) (Anticipation) Rejection of Claims 13-16*

Claims 13-16 stand rejected under 35 U.S.C. § 102(b) as allegedly anticipated by Kaehler et al., *Journal of Vascular Surgery*, 9(4) (April 1989) (hereinafter “Kaehler et al.”). In particular, the Office alleges that Kaehler et al. describes a vascular graft that has a structure of spaced apart

* This rejection is set forth in the Decision on Appeal mailed on July 21, 2003, which the Examiner incorporated into the Office Action mailed on November 21, 2003, by reference.

nodes interconnected by fibrils with pores present between the nodes and fibrils (Decision on Appeal mailed July 21, 2003, page 8). Moreover, the Office alleges that "solidified or precipitated collagen substantially filled the pores of the vascular graft," and that "Kaehler also teaches that the solidification or precipitation of collagen from its solution depends upon pH and temperature considerations" (Decision on Appeal mailed July 21, 2003, page 9). For the reasons set forth below, the rejection under 35 U.S.C. § 102(b) is traversed.

To clarify remarks of record, Kaehler et al. discloses a vascular graft having interstices, wherein some collagen precipitate may be present in the interstices of the graft as a result of forcing a collagen solution having a pH of 7.2 into the interstices of the graft, subsequently incubating the graft at 37 °C for 60 minutes, and then air-drying the graft as part of a precoating process (see Kaehler et al., page 536). In this regard, Kaehler et al. teaches adjusting the pH of the collagen solution to 7.2 prior to applying the solution to the graft (*id.*). Forcing such a pH-adjusted collagen solution into the interstices of a graft as part of Kaehler et al.'s precoating process is distinct from impregnating the pores of a vascular graft with a solution and subsequently subjecting the solution, while in the pores, to conditions of pH and temperature to form an insoluble substrate site for cellular attachment as taught by the present application. As stated in the present application, the biodegradable materials of the present invention are intended to serve as fillers for the pores rather than merely coat a portion of the expanded polytetrafluoroethylene substrate (see col. 4, lines 1-2, of the present application).

With that said, in an effort to expedite prosecution, claim 13 has been amended to recite an implantable prosthesis that has pores that contain a solution of a biodegradable composition

Applicant: Weadock et al.
Application No.: 09/391,762
Filing Date: September 8, 1999
Docket No.: 760-115 RES
Page 11

having an acidic pH, wherein the biodegradable composition forms a precipitate that substantially fills the pores at selected conditions of temperature and pH to form an insoluble substrate site for cellular attachment. Failing to disclose a vascular graft that has pores that contain a solution of a biodegradable composition having an acidic pH as recited in claim 13, Kaehler et al. does not anticipate claim 13 and claims dependent thereon. Accordingly, the rejection under 35 U.S.C. § 102(b) with respect to claims 14-16 should be withdrawn.

35 U.S.C. § 103(a) (Obviousness) Rejection of Claims 17-18*

Claims 17 and 18 stand rejected under 35 U.S.C. § 103(a) as allegedly obvious over the combination of Kaehler et al., U.S. Patent No. 5,037,377 (hereinafter "Alonso"), and Tran and Walt, *Journal of Colloid and Interface Science*, 132(2) (October 15, 1989) (hereinafter "Tran"). For the reasons set forth below, the rejection of claims 17 and 18 under 35 U.S.C. § 103 is traversed.

In view of the amendment to claim 13, claims 17 and 18 are now directed to an implantable prosthesis having a body of expanded polytetrafluoroethylene having a structure of spaced apart nodes interconnected by fibrils with pores present between the nodes and fibrils, wherein the pores contain a solution of a biodegradable composition having an acidic pH, wherein the biodegradable composition forms a precipitate that substantially fills the pores at selected conditions of temperature and pH to form an insoluble substrate site for cellular

* This rejection is set forth in the Decision on Appeal mailed on July 21, 2003, which the Examiner incorporated into the Office Action mailed on November 21, 2003, by reference.

attachment. None of the cited references, however, alone or in combination, teach or reasonably suggest such a prosthesis, and there is no teaching or suggestion in any of the cited references that would lead one of ordinary skill in the art to the present invention.

As discussed above, Kaehler et al. discloses a vascular graft having interstices, wherein some collagen precipitate may be present in the interstices of the graft as a result of precoating the graft with a collagen solution having a pH of 7.2 (see Kaehler et al., page 536). There is no disclosure whatsoever of an implantable prosthesis having a body of expanded polytetrafluoroethylene having a structure of spaced apart nodes interconnected by fibrils with pores present between the nodes and fibrils, wherein the pores contain a solution of a biodegradable composition having an acidic pH, and wherein the biodegradable composition forms a precipitate that substantially fills the pores at selected conditions of temperature and pH to form an insoluble substrate site for cellular attachment.

Moreover, neither Alonso nor Tran teach or suggest such an implantable member. Alonso discloses impregnating fabric with soluble collagen and incubating the fabric to reconstitute collagen fibers on the fabric (see Alonso, col. 3, lines 56-60). There is no teaching or suggestion of providing expanded polytetrafluoroethylene having a structure of spaced apart nodes interconnected by fibrils with pores present between the pores and fibrils, much less a teaching or suggestion of pores containing a solution of a biodegradable composition having an acidic pH, wherein the biodegradable composition forms a precipitate that substantially fills the pores at selected conditions of temperature and pH to form an insoluble substrate site for cellular attachment.

As regards Tran, that reference discloses utilizing plasma deposition to form an alkylamine surface on polytetrafluoroethylene grafts and subsequently binding a reacting species, such as collagen, to the activated surface (see, e.g., Tran, pages 379-380). There is no teaching or suggestion of an implantable prosthesis that has a body of expanded polytetrafluoroethylene having pores that contain a solution of a biodegradable composition having an acidic pH, wherein the biodegradable composition forms a precipitate that substantially fills the pores at selected conditions of temperature and pH to form an insoluble substrate site for cellular attachment, as recited in the pending claims. In fact, Tran teaches away from the present invention, indicating that "activation is localized very close to the surface since the reacting species cannot penetrate to any significant depth" (see Tran, page 380).

Failing to disclose or suggest the present invention, Kaehler et al., Alonso, and Tran (alone or in combination) do not render the present invention obvious. Accordingly, the rejection under 35 U.S.C. § 103(a) with respect to claims 17 and 18 should be withdrawn.

35 U.S.C. § 103(a) (Obviousness) Rejection of Claims 1-10*

Claims 1-10 stand rejected under 35 U.S.C. § 103(a) as allegedly obvious over Kaehler et al. in view of U.S. Patent No. 5,197,977 (hereinafter "Hoffman '977") and Alonso. For the reasons set forth below, this rejection is traversed.

* This rejection is set forth in the Decision on Appeal mailed on July 21, 2003, which the Examiner incorporated into the Office Action mailed on November 21, 2003, by reference.

Claim 1, claims 2-4, 7, and 9 (which depend from claim 1), and claim 10 (which depends from claim 9) are directed to an implantable member that has an expanded polytetrafluoroethylene substrate having pores that are filled with a solid precipitate of a material of natural origin. Claims 6 and 8 were cancelled by way of the Response to a New Ground of Rejection Pursuant to 37 C.F.R. § 1.196(b) (dated September 12, 2003). Cancellation of claim 5 is requested herein. As amended, claims 1, 2-4, 7, and 9 now require that the solid precipitate be formed *in situ* from an acidic solution that is pH-adjusted within the pores. None of the cited references, alone or in combination, teach or reasonably suggest such an implantable member.

As discussed above, Kaehler et al. discloses a vascular graft having interstices, wherein some collagen precipitate may be present in the interstices of the graft as a result of forcing a collagen solution having a pH of 7.2 into the interstices of a graft, subsequently incubating the graft at 37 °C for 60 minutes, and then air-drying the graft. There is no teaching or suggestion of forming a precipitate of a material of natural origin from a solution that is pH-adjusted within the pores of an expanded polytetrafluoroethylene substrate, as now required by pending claims 1-10. In fact, Kaehler et al. teaches adjusting the pH of the collagen solution referenced therein prior to application to a vascular graft and, as such, teaches away from the present invention.

With regard to Hoffman '977, that reference, in contrast to Kaehler et al., discloses applying a collagen-containing dispersion to the inner surface of a graft, allowing the dispersion to dry, and subsequently crosslinking the collagen to render the graft blood-tight and to provide a reservoir for the release of a drug (see Hoffman '977, col. 2, lines 26-29, and 39-46). There is no teaching whatsoever in Hoffman '977 of a graft having a polytetrafluoroethylene substrate, as

acknowledged by the Office (see, e.g., Examiner's Answer, Paper #15, page 7), much less a teaching or suggestion of an implantable member having an expanded polytetrafluoroethylene substrate having pores that are filled with a solid precipitate of a material of natural origin that is formed *in situ* from a solution that is pH-adjusted within the pores.

Turning to Alonso, that reference, as discussed above, merely discloses impregnating fabric with soluble collagen and incubating the fabric to reconstitute collagen fibers on the fabric (see Alonso, col. 3, lines 56-60). Accordingly, it cannot properly be said that Alonso remedies the deficiencies of Kaehler et al. and Hoffman '977. Indeed, given the disparate teachings of Kaehler et al., Hoffman '977, and Alonso, one of ordinary skill in the art would not even be motivated to combine their teachings.

In view of the foregoing, the combination of Kaehler et al., Hoffman '977, and Alonso fail to disclose or suggest the present invention. Accordingly, the rejection should be withdrawn.

35 U.S.C. § 103(a) (Obviousness) Rejection of Claims 11-12*

Claims 11 and 12 stand rejected under 35 U.S.C. § 103(a) as allegedly obvious over Kaehler et al. in combination with Hoffman '977, Alonso, and Tran. For the reasons set forth below, the rejection of claims 11 and 12 under 35 U.S.C. §103(a) is traversed.

* This rejection is set forth in the Decision on Appeal mailed on July 21, 2003, which the Examiner incorporated into the Office Action mailed on November 21, 2003, by reference.

In view of the amendment to claim 1, claim 11 (which depends from claim 1) and claim 12 (which depends from claim 11) are now directed to an implantable member that has an expanded polytetrafluoroethylene substrate having pores that are filled with a solid precipitate of a material of natural origin that is formed *in situ* from a solution that is pH-adjusted within the pores. For the same reasons discussed above with respect to claims 1-10, Kaehler et al., Hoffman '977, and Alonso (alone or in combination) fail to teach or suggest such an implantable member.

Moreover, Tran does not cure the deficiencies of Kaehler et al., Hoffman '977, and Alonso. As discussed above, Tran discloses utilizing plasma deposition to form an alkylamine surface on polytetrafluoroethylene grafts and subsequently binding a reacting species, such as collagen, to the activated surface by means of a glutaraldehyde crosslinker. There is no teaching or suggestion whatsoever in Tran of an implantable member that has a body of expanded polytetrafluoroethylene having pores that are filled with a solid precipitate of a material of natural origin formed *in situ* from a solution that is pH-adjusted within the pores as now required by claims 11-12.

In view of the foregoing, Kaehler et al., Hoffman '977, Alonso, and Tran (alone or in combination) do not render claims 11 and 12 obvious. Accordingly, the rejection under 35 U.S.C. § 103(a) with respect to claims 11 and 12 should be withdrawn.

35 U.S.C. § 103(a) (Obviousness) Rejection of Claims 19 and 20

Claims 19 and 20 stand rejected under 35 U.S.C. § 103(a) as allegedly obvious over Kaehler et al. in combination with Hoffman '977. For the reasons set forth below, the rejection of claims 19 and 20 under 35 U.S.C. § 103(a) is traversed.

In view of the amendment to claim 13, claim 19 (which depends from claim 13) and claim 20 (which depends from claim 19) are now directed to an implantable prosthesis having a body of expanded polytetrafluoroethylene having a structure of spaced apart nodes interconnected by fibrils with pores present between the nodes and fibrils, wherein the pores contain a solution of a biodegradable composition having pH, and wherein the biodegradable composition forms a precipitate that substantially fills the pores at selected conditions of temperature and pH to form an insoluble substrate site for cellular attachment. Kaehler et al. and Hoffman '977 (alone or in combination) fail to disclose or suggest such an implantable member.

As previously stated, Kaehler et al. discloses a vascular graft having interstices, wherein some collagen precipitate may be present in the interstices of the graft as a result of precoating the graft with a collagen solution having a pH of 7.2 (see Kaehler et al., page 536). There is no disclosure whatsoever of an implantable prosthesis having a body of expanded polytetrafluoroethylene having a structure of spaced apart nodes interconnected by fibrils with pores present between the nodes and fibrils, wherein the pores contain a solution of a biodegradable composition having an acidic pH, and wherein the biodegradable composition forms a precipitate that substantially fills the pores at selected conditions of temperature and pH to form an insoluble substrate site for cellular attachment.

Applicant: Weadock et al.
Application No.: 09/391,762
Filing Date: September 8, 1999
Docket No.: 760-115 RES
Page 18

With regard to Hoffman '977, that reference, as discussed above, does not disclose a graft having a polytetrafluoroethylene substrate. Furthermore, Hoffman '977 does not teach or suggest an implantable prosthesis having pores that contain a solution of a biodegradable composition having an acidic pH, wherein the biodegradable composition forms a precipitate that substantially fills the pores at selected conditions of temperature and pH to form an insoluble substrate site for cellular attachment.

As such, Hoffmann '977 does not overcome the deficiencies of Kaehler et al. Moreover, viewing each reference for what it reasonably teaches as a whole, there is no motivation or suggestion to combine their teachings.


In view of the foregoing, Kaehler et al. and Hoffman '977 (alone or in combination) do not teach or suggest the present invention. Accordingly, the rejection under 35 U.S.C. § 103(a) with respect to claims 19 and 20 should be withdrawn.

Applicant: Weadock et al.
Application No.: 09/391,762
Filing Date: September 8, 1999
Docket No.: 760-115 RES
Page 19

Conclusion

The claims are believed to be allowable over the art and the application in good and proper form for allowance. The Examiner is invited to contact the undersigned if he has any questions regarding this submission or, if in his opinion, a teleconference call would expedite prosecution of the subject application.

Respectfully submitted,


Andrea M. Wilkovich
Registration No. 53,773

HOFFMANN & BARON, LLP
6900 Jericho Turnpike
Syosset, New York 11791
(973) 331-1700